

CLAIMS

What is claimed and desired to be secured by Letters Patent is as follows:

1. An elongated structural rebar for reinforcing concrete material comprising:
a fibrous reinforcing member; and
a hydraulic binder embedded and dispersed within said fibrous reinforcing member.
2. The elongated structural rebar of claim 1 wherein said fibrous reinforcing member is comprised of a material selected from the group consisting of one or more of fiberglass, graphite, carbon, and aramid fibers.
3. The elongated structural rebar of claim 1 wherein said fibrous reinforcing member is comprised of fiberglass.
4. The elongated structural rebar of claim 3 wherein the fiberglass is alkaline-resistant.
5. The elongated structural rebar of claim 1 wherein fibrous reinforcing member comprises elongated fibers with a fiber orientation selected from the group consisting of 0° unidirectional, 90° unidirectional, +45/-45° double bias, 0°/90° biaxial longitudinal/transverse, 0°/90°/45° triaxial, 0°/+45°/-45° longitudinal triaxial, +45°/90°/-45° transverse triaxial, 0°/+45°/90°/-45° quadraxial, and 0°/-45°/90°/+45° quadraxial.
6. The elongated structural rebar of claim 1 wherein said fibrous reinforcing member comprises fibers woven with a weave selected from the group consisting of a bias, plain, twill, leno, heat set, long shaft satin, plain satin, basket, unidirectional and mock-leno weave.
7. The elongated structural rebar of claim 1 wherein said hydraulic binder comprises a Portland cement.
8. The elongated structural rebar of claim 1 wherein said hydraulic binder is also mixed with chopped fiberglass fibers.
9. The elongated structural rebar of claim 1 wherein said wherein said fibrous reinforcing member comprises a mat, woven material, or knitted material that is wound into a roll such that the hydraulic binder is embedded and dispersed within said roll.
10. The elongated structural rebar of claim 1 wherein said fibrous reinforcing member has a finished side and a woven side.
11. The elongated structural rebar of claim 1 wherein said rebar is wound into a spool or roll lengthwise.

12. The elongated structural rebar of claim 1 wherein at least a portion of said rebar is sealed with a sealant.
13. The elongated structural rebar of claim 12 wherein at least a portion of said rebar has a colored marker thereon.
14. The elongated structural rebar of claim 13 wherein said colored marker is opposite said sealant.
15. The elongated structural rebar of claim 1 wherein the fibrous reinforcing member is sized within a fluorine-containing chemical that renders the member non-biodegradable.
16. The elongated structural rebar of claim 1 further comprising a cord extending along all or a part of the rebar lengthwise.
17. The elongated structural rebar of claim 16 wherein said cord is comprised of nylon.
18. The elongated structural rebar of claim 1 wherein said fibrous reinforcing member includes at least one outer fibrous member at least partially surrounding one or more internal fibrous members.
19. The elongated structural rebar of claim 18 wherein said fibrous reinforcing member includes a plurality of internal fibrous members, at least one of the internal fibrous members having a width different from one or more of the other internal fibrous members.
20. The elongated structural rebar of claim 19 wherein at least two internal fibrous members each have a woven side and a finished side, and wherein at least two adjacent internal fibrous members are positioned with the woven side and finished side having the same orientation.
21. The elongated structural rebar of claim 18 wherein chopped fibers are provided between one or more of the internal fibrous members.
22. The elongated structural rebar of claim 18 wherein said hydraulic binder is provided between one or more of the internal fibrous members.
23. The elongated structural rebar of claim 18 wherein the outer fibrous member and said internal fibrous members each have a plurality of fibers, the fibers of said outer fibrous member being oriented different than those of said internal fibrous member.
24. The elongated structural rebar of claim 23 wherein the fibers of the outer fibrous member are oriented at a 0° angle and said fibers of said internal fibrous members are oriented at a 90° angle.

25. A method of constructing a structural rebar for reinforcing concrete, said method comprising:
providing a fibrous reinforcing member having a plurality of fibers; and
embedding and dispersing a hydraulic binder within said fibrous reinforcing member.
26. The method of constructing a structural rebar of claim 25 wherein said fibrous reinforcing member is comprised of a material selected from the group consisting of one or more of fiberglass, graphite, carbon, and aramid fibers.
27. The method of constructing a structural rebar of claim 25 wherein said fibrous reinforcing member is comprised of fiberglass.
28. The method of constructing a structural rebar of claim 27 wherein the fiberglass is alkaline-resistant.
29. The method of constructing a structural rebar of claim 25 wherein the reinforcing member comprises elongated fibers with a fiber orientation selected from the group consisting of 0° unidirectional, 90° unidirectional, +45/-45° double bias, 0°/90° biaxial longitudinal/transverse, 0°/90°/45° triaxial, 0°/+45°/-45° longitudinal triaxial, +45°/90°/-45° transverse triaxial, 0°/+45°/90°/-45° quadraxial, and 0°/-45°/90°/+45° quadraxial.
30. The method of constructing a structural rebar of claim 25 wherein said fibrous reinforcing member comprises fibers woven with a weave selected from the group consisting of a bias, plain, twill, leno, heat set, long shaft satin, plain satin, basket, unidirectional and mock-leno weave.
31. The method of constructing a structural rebar of claim 25 wherein said hydraulic binder comprises a Portland cement.
32. The method of constructing a structural rebar of claim 25 further comprising the step of embedding and dispersing chopped fibers within said fibrous reinforcing member.
33. The method of constructing a structural rebar of claim 25 further comprising the step of sealing at least a portion of said rebar with a sealant.
34. The method of constructing a structural rebar of claim 33 further comprising the step of marking said rebar with a marker to orient said sealant.

35. The method of constructing a structural rebar of claim 25 further comprising the step of sizing the fibrous reinforcing member with a fluorine-containing chemical that renders the member non-biodegradable.
36. The method of constructing a structural rebar of claim 25 further comprising the step of extending a cord along all or a part of the rebar lengthwise.
37. The method of constructing a structural rebar of claim 25 wherein said fibrous reinforcing member is initially unrolled, and said embedding and dispersing step comprises providing said hydraulic binder on said at least a portion of said unrolled fibrous reinforcing member, and then rolling said fibrous reinforcing member into a roll.
38. The method of constructing a structural rebar of claim 25 wherein said fibrous reinforcing member comprises an outer fibrous member surrounding at least partially a plurality of internal fibrous members, and wherein said embedding and dispersing step comprises providing said hydraulic binder between said internal fibrous members.
39. The method of constructing a structural rebar of claim 38 wherein said hydraulic binder is further provided between at least one internal fibrous member and said outer fibrous member.
40. The method of constructing a structural rebar of claim 25 wherein said fibrous reinforcing member includes a plurality of internal fibrous members, at least one of the internal fibrous members having a width different from one or more of the other internal fibrous members.
41. The method of constructing a structural rebar of claim 38 wherein chopped fibers are provided between one or more of the internal fibrous members.

42. A method for reinforcing concrete, said method comprising:

providing an elongated structural rebar comprised of a fibrous reinforcing member having a plurality of fibers and a hydraulic binder embedded and dispersed within said fibrous reinforcing member;

providing a wetted cement adjacent to said elongated structural rebar; and

permitting said wetted cement to dry into concrete that is reinforced by said rebar.